

FIG. 1A

2/24

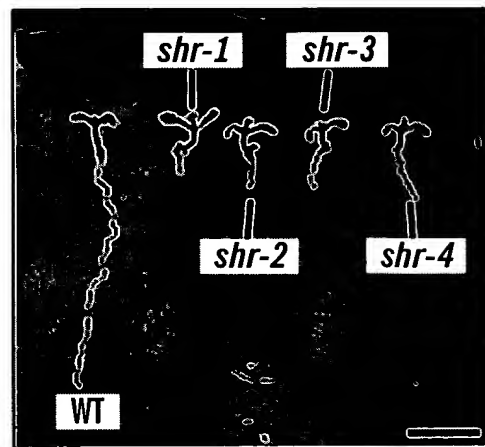


FIG. 1B

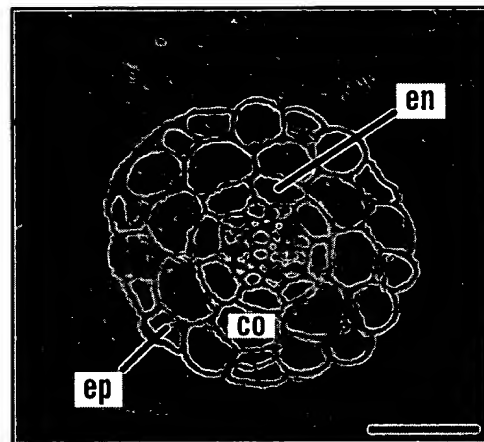


FIG. 1C

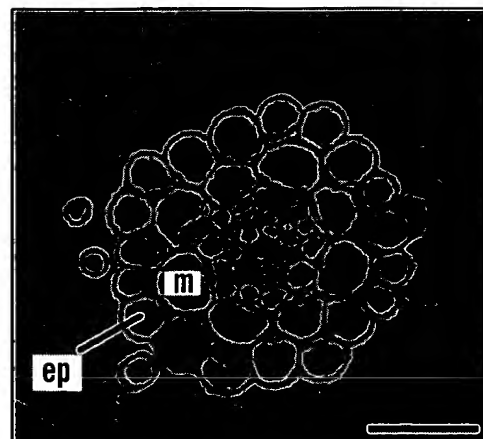
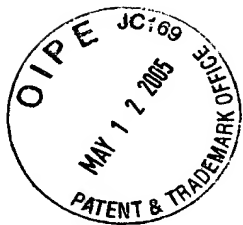


FIG. 1D



3/24

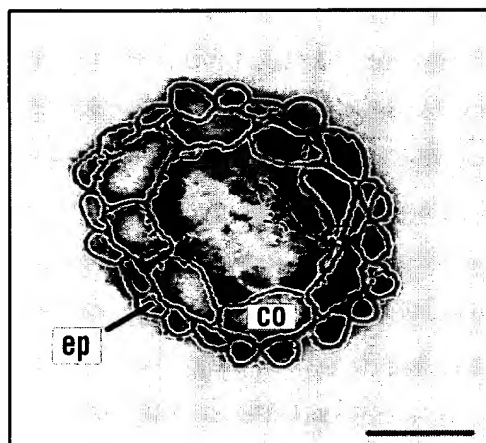


FIG. 1E

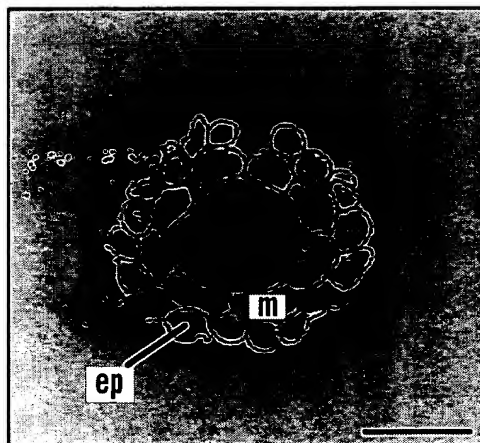


FIG. 1F

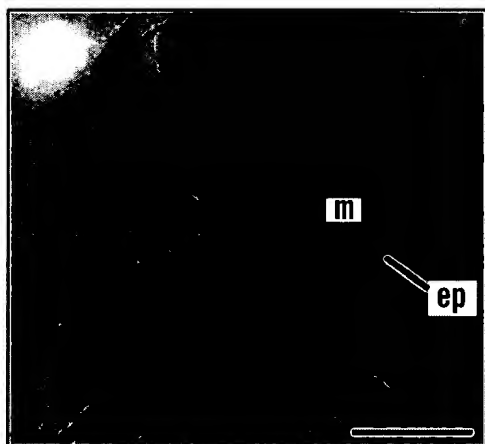


FIG. 1G

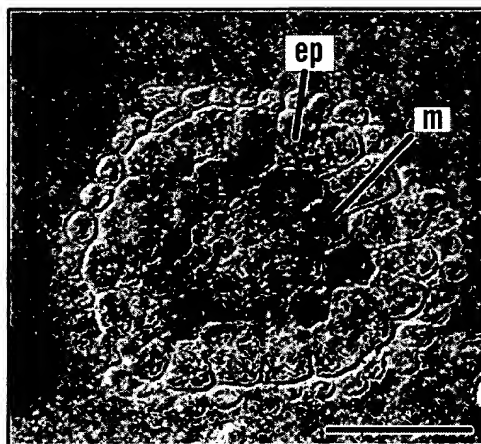


FIG. 1H

4/24

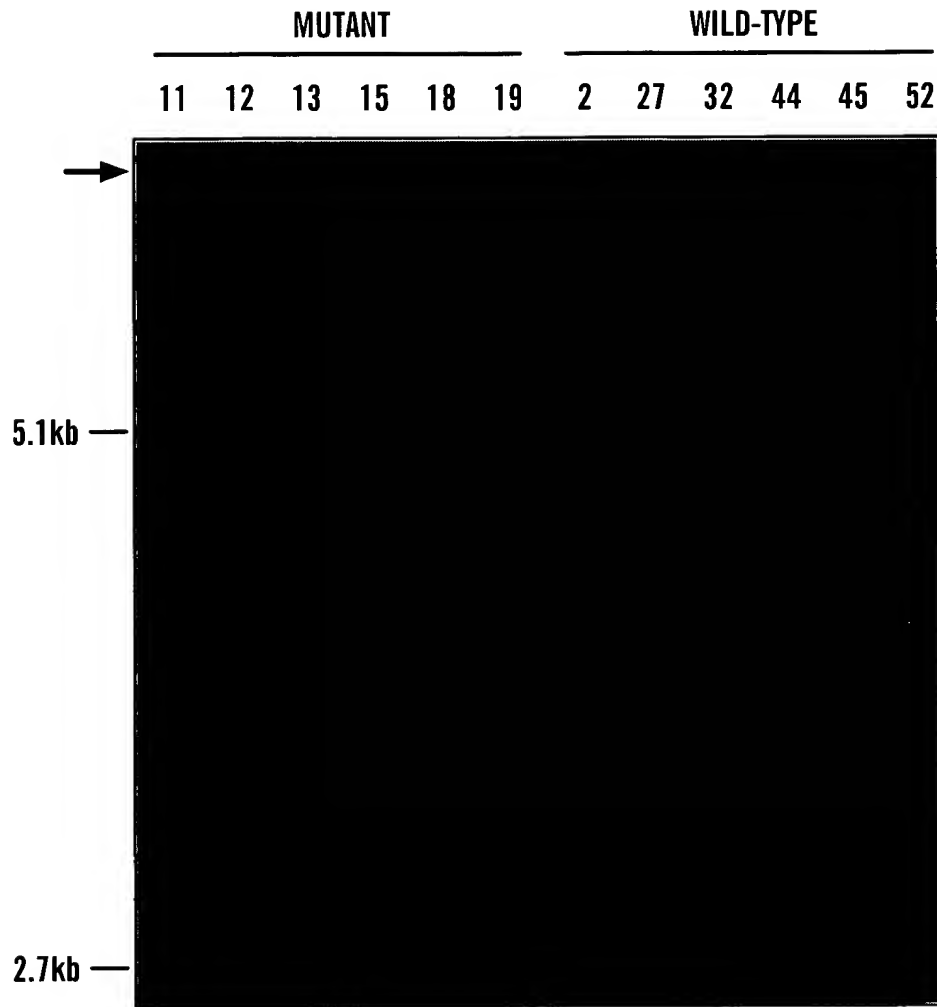
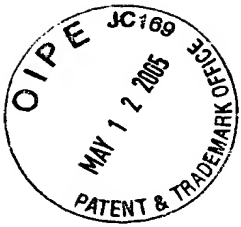
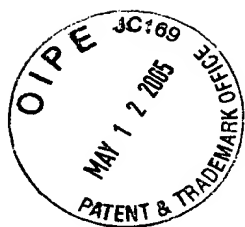
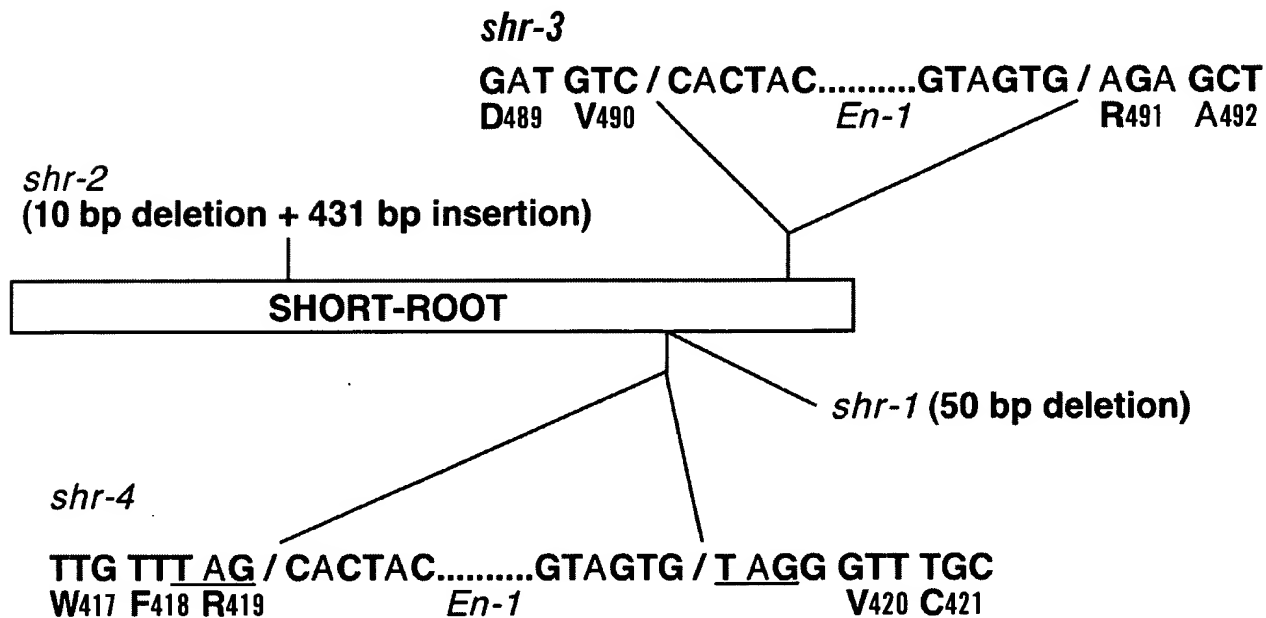


FIG. 2A



5/24

| | | |
|-----|-----|---|
| LS | 144 | PFIRFTQLTANQAILEAINGNHQAIHIVDFDINHGVPWPPLMQALADRYPA-PTLRITG |
| GAI | 248 | PYLKFAHFTANQAILEAFQ GK-KRVHVIDFSMSQGLQWPALMQALALRPGGPPVFRITG |
| RGA | 301 | PYLKFAHFTANQAILEAFEGK-KRVHVIDFSMNQGLQWPALMQALALREGGPPTFRLTG |
| SCR | 379 | PLVKFSHFTANQAIQEA FEKE-DSVHIIDLDIMQGLQWPGLFHI LASRPGGPPHVRLTG |
| SHR | 233 | PWATFGHVAANGAILEAVDGE-AKIHIVDISSTFCTQWPTLLEALATRSDDT PHLRLTT |

FIG. 2B**FIG. 2C**

6/24

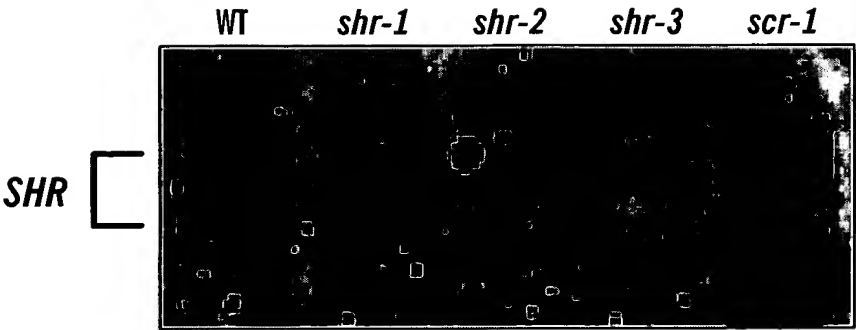
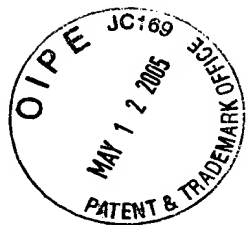


FIG. 3A

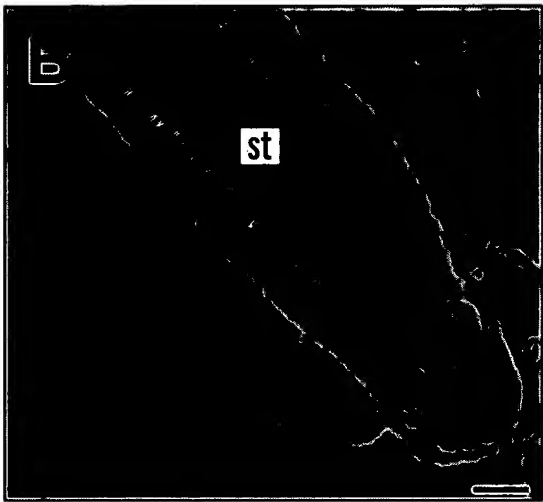


FIG. 3B

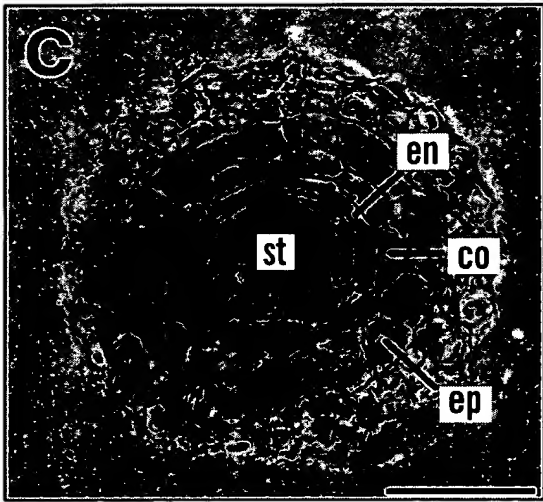


FIG. 3C

7/24

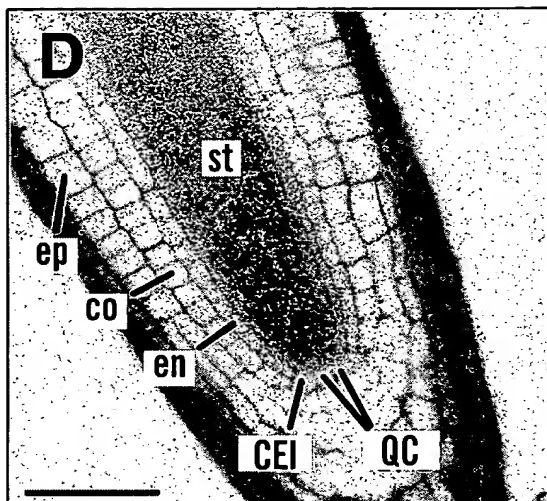


FIG. 3D

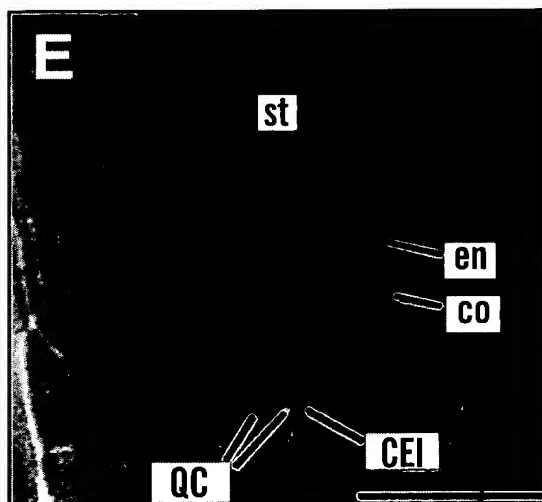


FIG. 3E

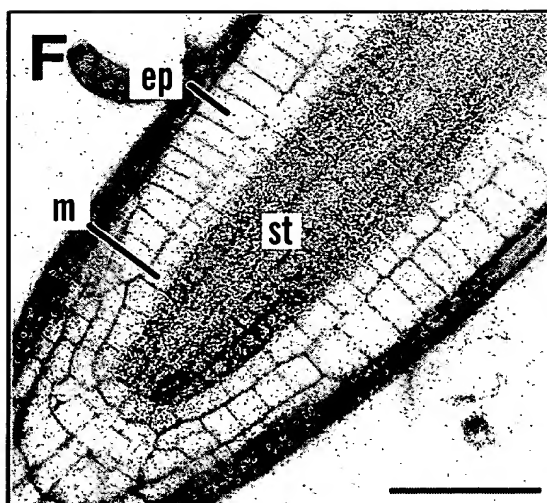


FIG. 3F

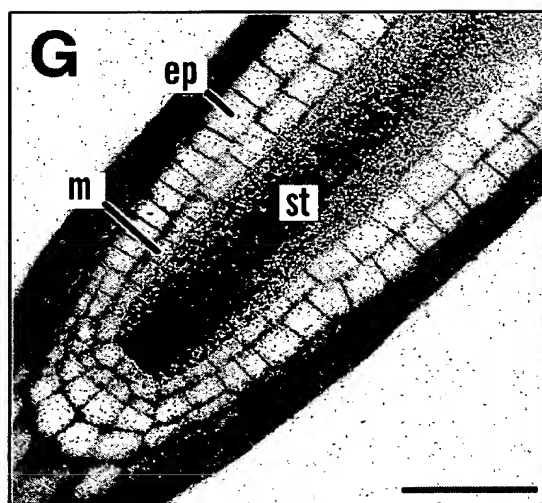


FIG. 3G

8/24

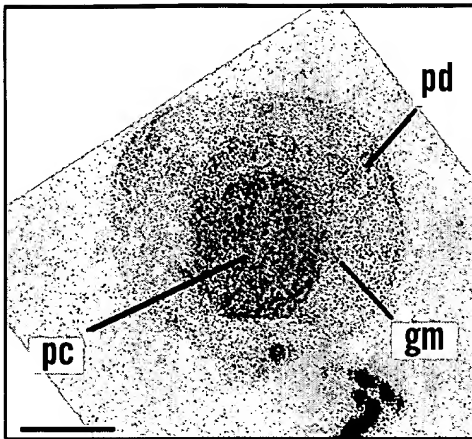
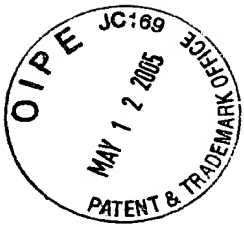


FIG. 4A

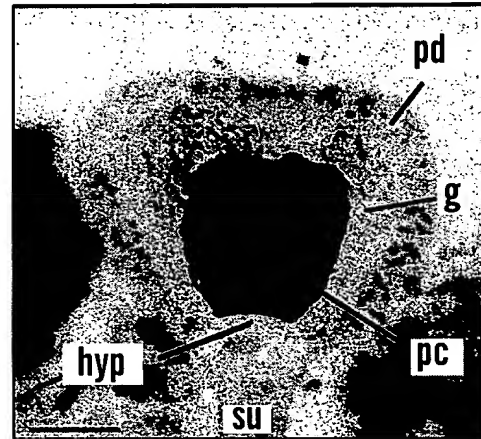


FIG. 4B

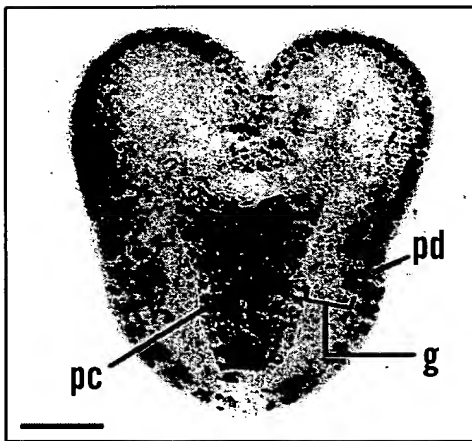


FIG. 4C

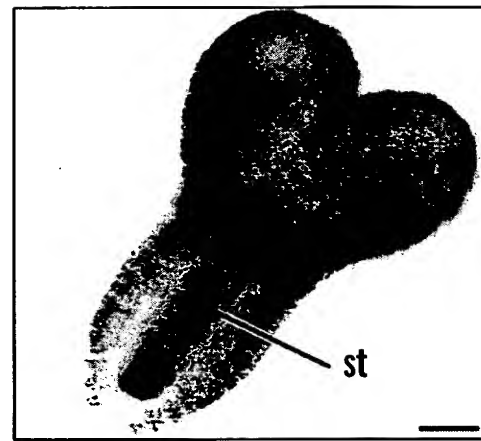


FIG. 4D

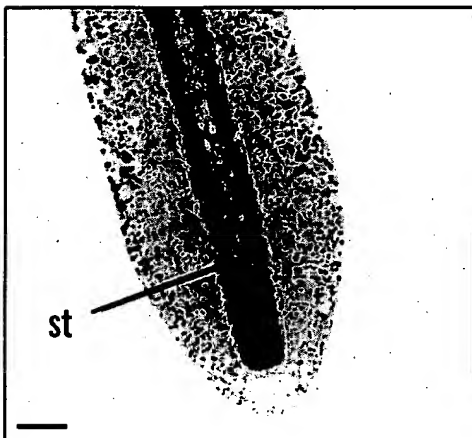


FIG. 4E

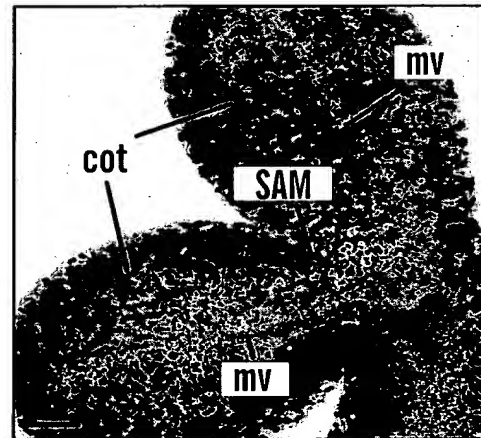


FIG. 4F

9/24

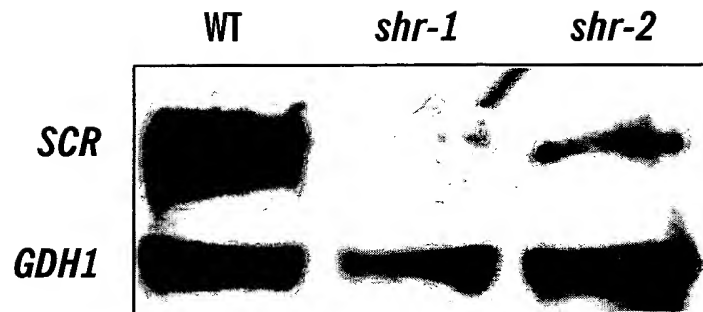


FIG. 5A

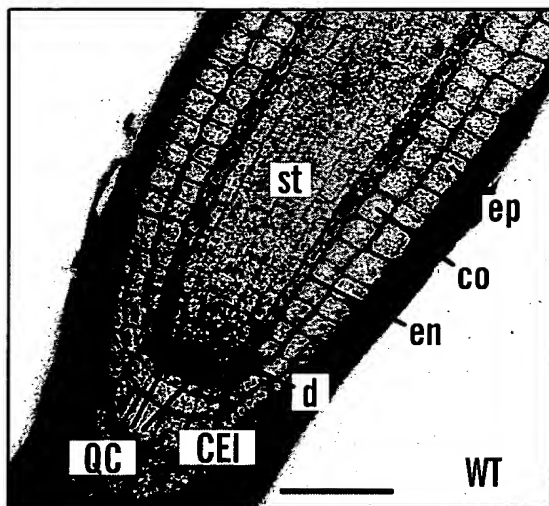


FIG. 5B

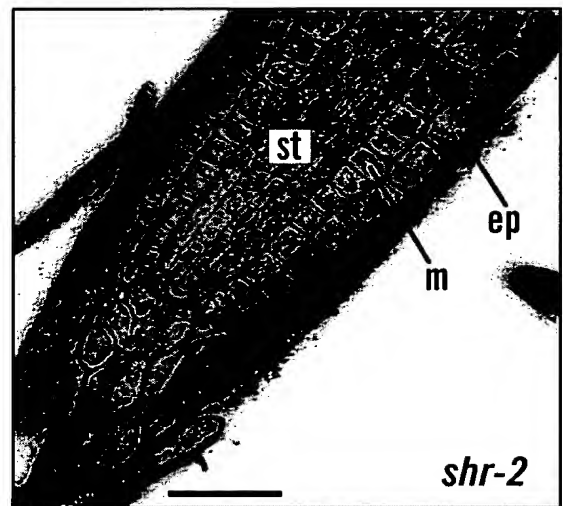
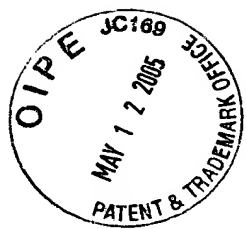


FIG. 5C



10/24

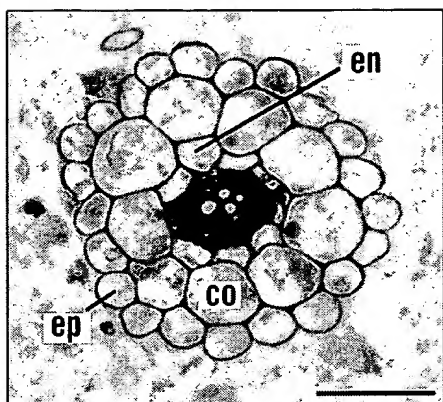


FIG. 6A

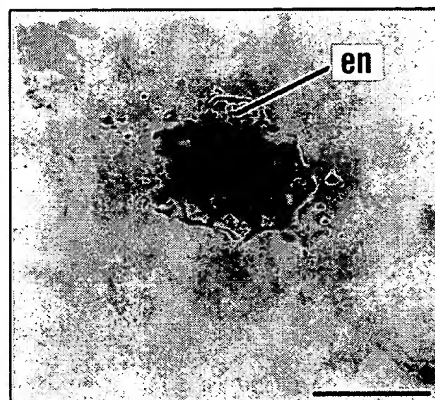


FIG. 6B

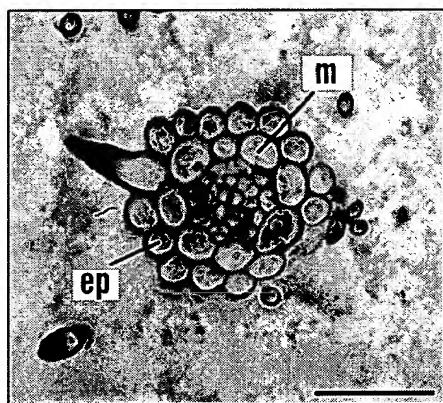


FIG. 6C

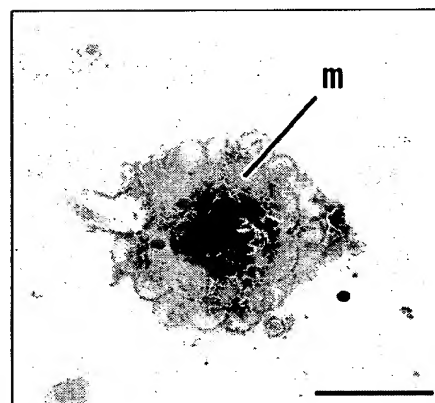


FIG. 6D

11/24

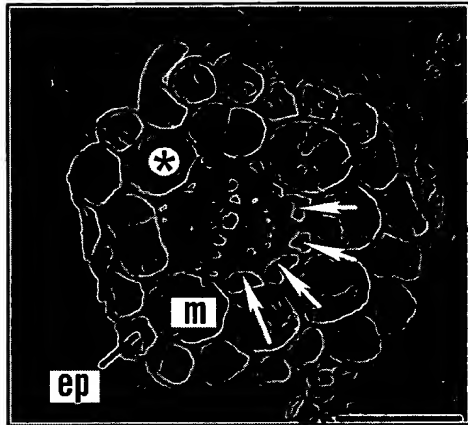


FIG. 6E

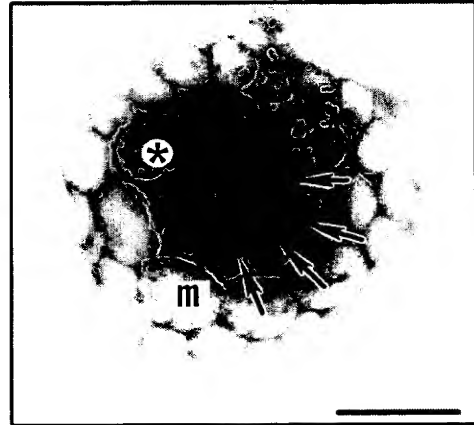


FIG. 6F

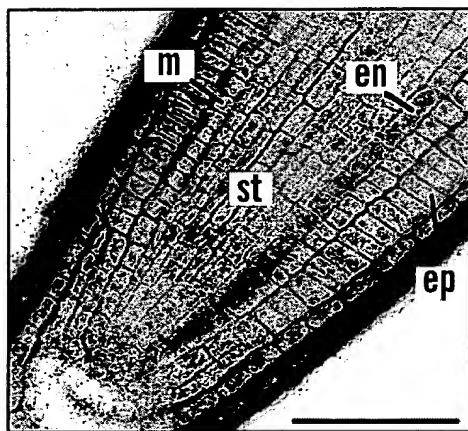


FIG. 6G

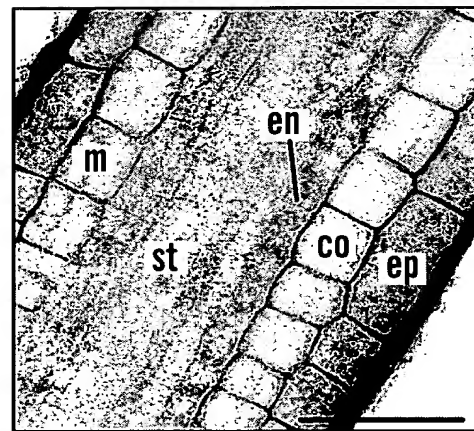


FIG. 6H

12/24

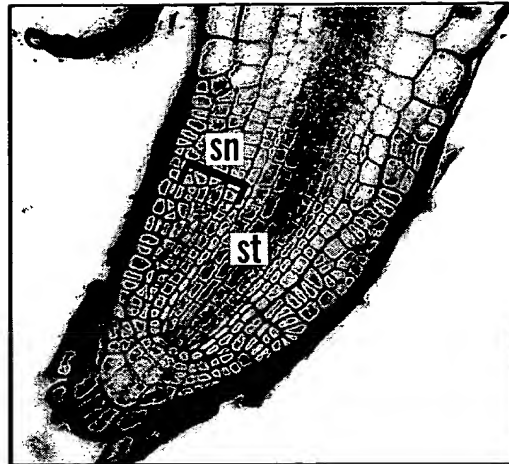


FIG. 7A

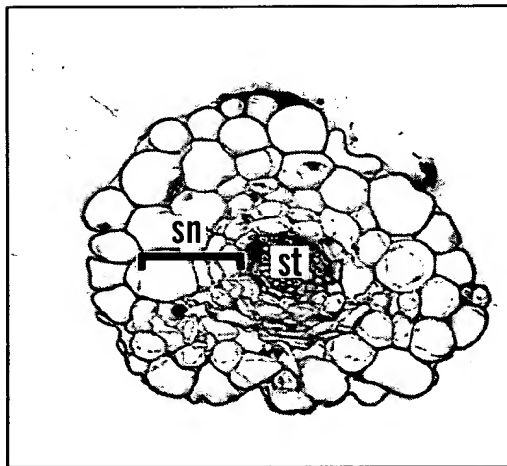


FIG. 7B

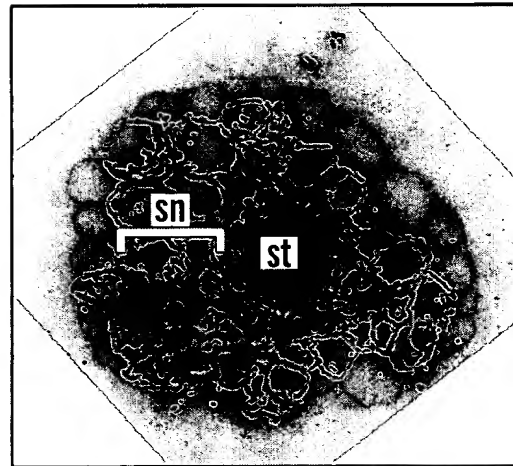


FIG. 7C

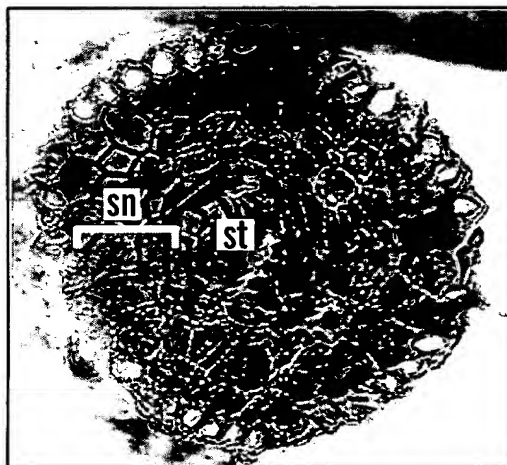


FIG. 7D

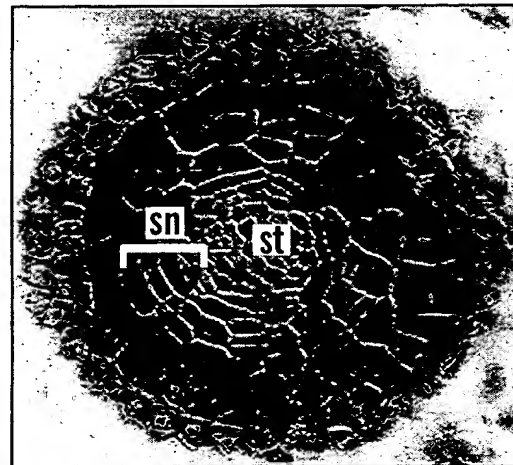
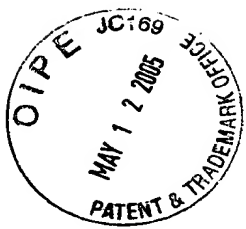


FIG. 7E

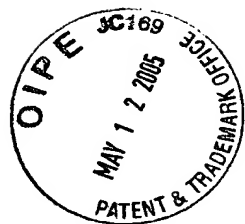


Replacement Sheet

13/24

| | | | | | | |
|------|------------|-------------|-------------|-------------|-------------|------------|
| 1 | atcgattaag | agaaaataga | gttttcatgc | accagtgttg | atagtaacgt | agtcgcggaa |
| 61 | tgtctaaaac | gattatgagt | ttggtgtttt | gattgggttag | aattgggtatt | agtaggacat |
| 121 | tctaactttt | ttgttagtct | gttgatttag | gatgcgtaaa | gagtcttttt | attttacacc |
| 181 | agttgagact | tgggatcgat | agtacttgaa | acacttggtt | ggtttcatgt | atttggccta |
| 241 | tatataaaca | aacatcgtaa | ttatatacgg | atttttttcg | gaattttacg | ccatatctgt |
| 301 | aagtatatat | aacatgcatg | tcgtttttcaa | attcatatga | tgaacgatcc | acgtaagtgc |
| 361 | tactactcct | acaatattgc | atgagagaga | tatgtattta | taaattttat | tttgaagaag |
| 421 | aaataagagg | gaaggttact | tgggtggatc | gatgtgaaaa | caaaagaaga | aaaagcgaaa |
| 481 | cccactaagc | cattacatga | tatcgacctt | cttatctttt | tcctctttat | tttatttttc |
| 541 | tcaggacttt | tttctactta | atgaaacctc | caaactatct | aactaatata | ctcccatgta |
| 601 | gaataaagaa | aattatataa | gatattgttg | atattttgta | actagaaaat | atatttgctc |
| 661 | tgtaattttt | cgtaagttaa | atcaacattt | ttcagtagaa | acaaatatta | ctgcaaaaag |
| 721 | taggatcatt | atttttgtcc | aaaatctcag | ttagctatag | ggttgtagta | aaaacaaaac |
| 781 | acattcttga | tttgcccaa | aaaataaaga | gagagaagaa | tattgttcaa | aagtggcttc |
| 841 | ttctctctct | aattatgttt | tcactaaacc | caattagatt | caaacagtct | acaaagtcca |
| 901 | aaagataaac | atgggacaac | aattcgatgc | aaaaaatcct | cttttcatgc | tcttttttta |
| 961 | ttctctagtc | ttttaaat | ctaataaaaa | ctcacaaatc | caccaaacc | attctctaca |
| 1021 | actcaccttc | atctagattt | accactccc | accgagaaac | acaagaaaaa | aatatacat |
| 1081 | atataaatat | acaagacaac | acatgatgct | gatgcaatat | acacaacaaa | gtattaaatc |
| 1141 | ttagatat | tgggtctccc | tttcttctat | tcattttctt | attcattaaa | aaaaaaaaat |
| 1201 | ggatactctc | tttagactag | tcagtctcca | acaacaacaa | caatccgata | gtatcattac |
| 1261 | aaatcaatct | tcgttaagca | gaacttccac | caccactact | ggctctccac | aaactgctta |
| 1321 | tcactacaac | tttccacaaa | acgacgtcgt | cgaagaatgc | ttcaactttt | tcatggatga |
| 1381 | agaagacctt | tcctcttctt | cttctcacca | caaccatcac | aaccacaaca | atcctaatac |
| 1441 | ttactactct | cctttcacta | ctcccaccca | ataccatccc | gccacatcat | caacccttc |
| 1501 | ctccaccgcc | gcagccgcag | ctttagcctc | gccttactcc | tcctccggcc | accataatga |
| 1561 | cccttccgcg | ttctccatac | ctcaaactcc | tcctgccttc | gacttctcag | ccaatgccaa |
| 1621 | gtgggcagac | tcgggtccttc | ttgaagcggc | acgtgccttc | tcgcacaaag | acactgcacg |
| 1681 | tgcgcaacaa | atcctatgga | cgctcaacga | gctctcttct | ccgtacggag | acaccgagca |
| 1741 | aaaactggct | tcttacttcc | tccaagctct | cttcaaccgc | atgaccgggt | caggcgaacg |
| 1801 | atgctaccga | accatggtaa | cagctgcagc | cacagagaag | acttgctcct | tcgagtcaac |
| 1861 | gcgaaaaact | gtactaaagt | tccaagaagt | tagccccctg | gccacgtttg | gacacgtggc |
| 1921 | ggcaaacgga | gcaatcttgg | aagcagtaga | cggagaggca | aagatccaca | tcgttgacat |
| 1981 | aagctccacg | ttttgcactc | aatggccgac | tcttctagaa | gcttttagcca | caagatcaga |
| 2041 | cgacacgcct | cacctaaggc | taaccacagt | tgtcgtggcc | aacaagtttg | tcaacgatca |
| 2101 | aacggcgctc | catcggatga | tgaagagat | cggaaaccga | atggagaaat | tcgctaggct |
| 2161 | tatgggagtt | cctttcaa | ttaacattat | tcatcacggt | ggagatttat | ctgagtttga |
| 2221 | tctcaacgaa | ctcgacgtta | aaccagacga | agtcttggtc | attaactgcg | taggcgcgat |
| 2281 | gcatgggatc | gcttcacgtg | gaagccctag | agacgtgtg | atatcgagtt | tccgacggtt |
| 2341 | aagaccgagg | attgtgacgg | tcgtagaaga | agaagctgat | cttgtcggag | aagaagaagg |
| 2401 | tggctttgat | gatgagttct | tgagagggtt | tggagaatgt | ttacgatggg | ttagggtttg |
| 2461 | cttcgagtca | tgggaagaga | gttttccaag | gacgagcaac | gagaggttga | tgctagagcg |
| 2521 | tgcagcggga | cgtgcgatcg | ttgatcttgt | ggcttgtgag | ccgtcggatt | ccacggagag |
| 2581 | gcgagagaca | gcgaggaagt | ggtcgaggag | gatgaggaat | agtgggtttg | gagcgggtgg |
| 2641 | gtatagtgat | gaggtggcgg | atgatgtcag | agctttgttg | aggagatata | aagaaggtgt |
| 2701 | ttggctgatg | gtacagtgtc | ctgatgccgc | cggaaatattc | ctttgttgga | gagatcagcc |
| 2761 | ggtgggttgg | gctagtgcgt | ggcggccaac | gtaaagggtt | gtttttat | tttcataagg |
| 2821 | aattc | | | | | |

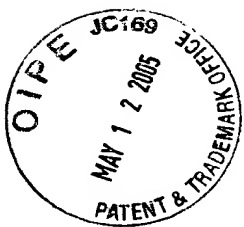
FIG. 8



14/24

MDTLFRLVSL QQQQQSDSII TNQSSLRSTS TTTTGSPQTA YHYNFPQNDV VEECFNFFMD
EEDLSSSSSH HNHNNHNNPN TYYSPTTPT QYHPATSSTP SSTAAAAALA SPYSSSGHHN
DPSAFSIPQT PPSFDFSANA KWADSVLLEA ARAFSDKDTA RAQQILWTLN ELSSPYGDTE
QKLASYFLQA LFNRMGTSGE RCYRTMVTAA ATEKTCSEFES TRKTVLKFQE VSPWATFGHV
AANGAILEAV DGEAKIHIVD ISSTFCTQWP TLLEALATRS DDTPHLRLLT VVANKFVND
QTASHRMMKE IGNRMEKFAR LMGVPFKFNI IHHVGDLEF DLNELDVKPD EVLAINCVGA
MHGASRGSP RDAVISSFRR LRPRIVTVVE EEADLVGEEE GGFDEFLLRG FGECLRWFRV
CFESWEESFP RTSNERLMLE RAAGRAIVDL VACEPSDSTE RRETARKWSR RMRNSGFGAV
GYSDEVADDV RALLRRYKEG VWSMVQCPDA AGIFLCWRDQ PVVWASAWRP T

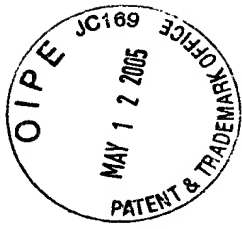
FIG. 9



15/24

1 aaaaaaaaaa aatggatact ctcttttagac tagtcagtct ccaacaacaa caacaatccg
61 atagtatcat tacaaatcaa tcttcgtaa gcagaacttc caccaccact actggctctc
121 cacaaactgc ttatcactac aactttccac aaaacgacgt cgtcgaagaa tgcttcaact
181 ttttcatgga tgaagaagac ctttctctct cttcttctca ccacaaccat cacaaccaca
241 acaatcctaa tacttactac tctcctttca ctactccac ccaataccat cccgccacat
301 catcaacccc ttcctccacc gccgcagccg cagctttagc ctgccttac tctcctccg
361 gccaccataa tgaccttcc gccgttctcca tactcacaac tctcctgtec ttcgacttct
421 cagccaatgc caagtgggca gactcgttcc ttcttgaagc ggcacgtgcc ttctccgaca
481 aagacactgc acgtgcgcaa caaatcctat ggacgctcaa cgagctctct tctccgtaat
541 gaaaaccgct tcattttcct tgtatttgct tgaggtagg attagaccat tgggtgttac
601 tttcgaatc ttccaattta gttgttact tccaattctt ccactcttta gtttactaaa
661 acaaacttat gtgccccata tttctccaac aatttgttga gtggtagctt acgttttact
721 gtatacgctt ttgcaggtta tatcagcaca accattaatg atggcccggt atgtttgatg
781 ctaagatgct ctgaccatc ttgtcttgct gctgttggtc atgatatggt tgacaaatta
841 gcgtctgaag acgaaaagga gaagtacaac agatatcttc ttaggtctta tattgaagac
901 aacagaaagg taagcagtct agaaaattta tatcacacag actggtatta atgtcgttgg
961 tcttttattg agcaaaaact ggcttcttac ttcctccaag ctctcttcaa ccgcatgacc
1021 gggttcaggcg aacgatgcta ccgaacctg gtaacagctg cagccacaga gaagacttgc
1081 tccttcgagt caacgcgaaa aactgtacta aagttccaag aagttagccc ctgggccacg
1141 tttggacacg tggcggaaca cggagcaatc ttggaagcag tagacggaga ggcaaagatc
1201 cacatcggtg acataagctc cacgttttgc actcaatggc cgactcttct agaagcttta
1261 gccacaagat cagacgacac gcctcaccta aggctaacca cagttgtcgt ggccaacaag
1321 tttgtcaacg atcaaacggc gtcgcatcgg atgatgaaag agatcggaaa ccgaatggag
1381 aaattcgcta ggcttatggg agttccttcc aaatttaaca ttattcatca cgttggagat
1441 ttatctgagt ttgatctcaa cgaactcgac gttaaaccag acgaagtctt ggccattaac
1501 tgcgtaggcg cgatgcatgg gatcgcttca cgtggaagcc ctagagacgc tgtgatatcg
1561 agtttccgac ggttaagacc gaggattgtg acggtcgtag aagaagaagc tgatcttgtc
1621 ggagaagaag aaggtggctt tgatgatgag ttcttgagag ggtttggaga atgtttacga
1681 tgggttaggg tttgcttcga gtcatgggaa gagagtcttc caaggacgag caacgagagg
1741 ttgatgctag agcgtgcagc gggacgtgcg atcgttgatc ttgtggcttg tgagccgtcg
1801 gattccacgg agaggcgaga gacagcgagg aagtggtcga ggaggatgag gaatagtggg
1861 tttggagcgg tggggtatag tgatgaggtg gcggatgatg tcagagcttt gttgaggaga
1921 tataaagaag gtgtttggct gatggtacag tgtcctgatg ccgccggaat attcctttgt
1981 tggagagatc agccggtggt ttgggctagt gcgtggcggc caacgtaaag ggttgttttt
2041 attttttcat aaggaattc

FIG. 10

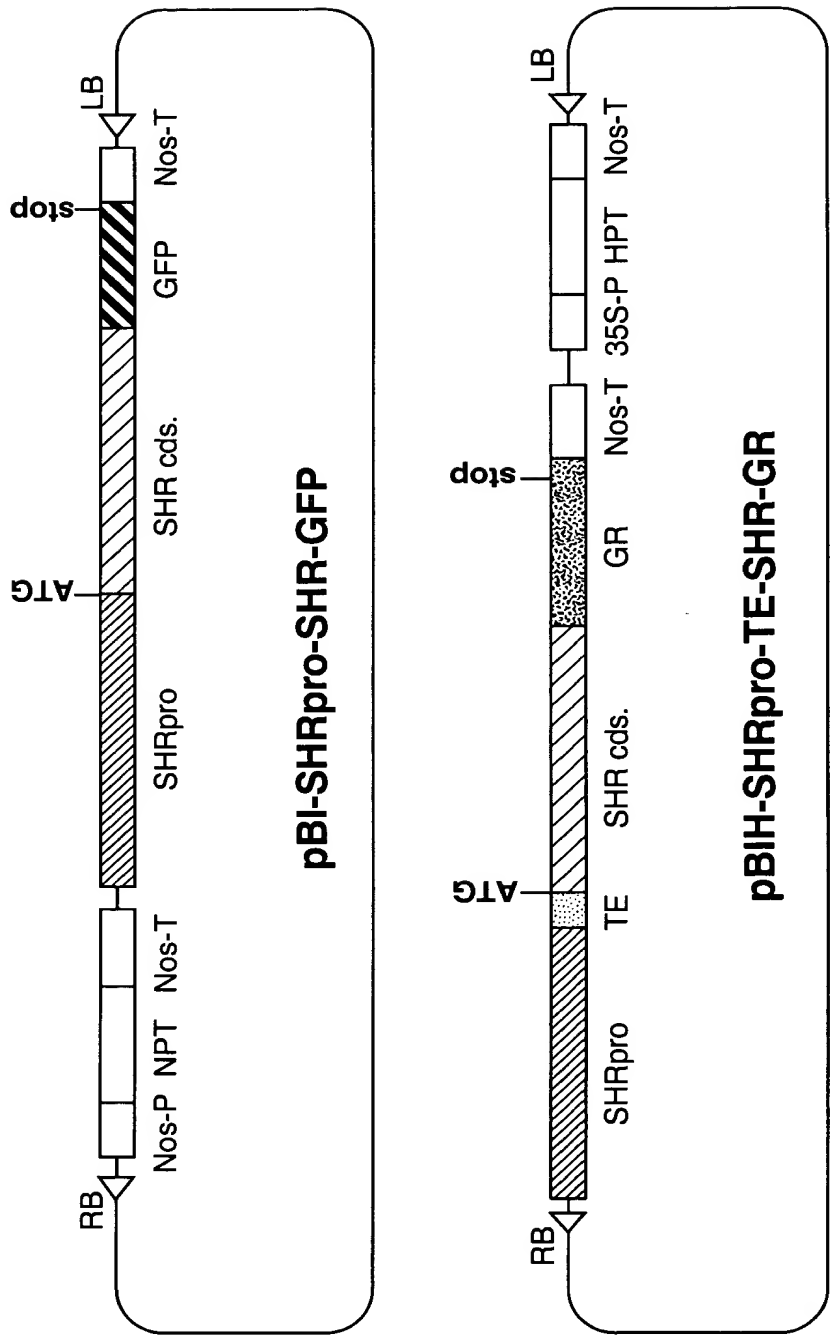
**FIG. 11**

16/24

2.5-kb SHORT-ROOT PROMOTER SEQUENCE

| 10 | 20 | 30 | 40 | 50 | |
|------------|-------------|-------------|------------|-------------|------|
| 1234567890 | 1234567890 | 1234567890 | 1234567890 | 1234567890 | |
| AGAAGCAGAG | CGTGGGGTTT | CTTCTAATAA | TTGTAGAAGA | AACTGATCAT | 50 |
| GAGAACATTT | GATCTACCAG | AGATGGTGAT | GACTCATAAG | ATGTAAATAT | 100 |
| CTACTGCATT | ATGTCTAGCC | TAGGCTATAA | TGTAGATTTG | ATCACTTTCT | 150 |
| TCATTAATTA | GTTTGGAATT | TTAGCATGAT | ATAGCATATA | TCTAAATATG | 200 |
| TCCGAAACTT | TCCTACATAC | TAGAAAATAT | GGAGAGTTAT | GTAATGTAGG | 250 |
| TTTGCTTGTT | AATATACAAA | ATAACATCAT | CATTTAGTTT | TTAGATTTTT | 300 |
| TATTTTATTT | TTTATAATGG | TGCTACGTAC | GTGGCGATCA | AATTATTCCA | 350 |
| ATTTTGAGAC | TTCGGGATTT | TAAACGAAAT | TAAACAATGG | GCATGAGCTC | 400 |
| GGGGGGATAG | ACAAGATTAA | TGCTTTGTAT | CGAGACAAAC | GAGAAAATCA | 450 |
| TGATGAGCCT | ATGCATTAAAG | TGCCGTTGGT | TAATTAGAGG | TTCGCATATA | 500 |
| CATAAACCAG | TAGACATATG | GATAAATATG | AACACACACA | CCAAAAAAGT | 550 |
| GGGAAATCTA | AATAAGTGTA | GAGAATAATA | AGTCCTCAGG | TGGGAGATTC | 600 |
| AAAGAGAGGA | CAATGAAGGG | TATATAGACT | CTAAACAAAA | ATGGCATGAC | 650 |
| TTAGTGAGGA | GGGTTTTAAA | TTGAAACAAG | TAGGATTGAA | GAACAAGAAA | 700 |
| ACAAAGAAGC | ATGCCCTAGA | TTTCTGAGAT | AATAATTACA | CATTGCTGTT | 750 |
| TATATAAGGT | AAGAGAATAT | GACACATTGG | TTGGTTTCTT | ACGGGTAAAT | 800 |
| GTGAAGAAAA | AAAAATAGTA | ATATTTGAGA | AAATCTAAAA | TAGTAAAGAG | 850 |
| GTATATATGG | AGAAGAAGAG | AGAAAAGGGA | AAAAATAGTG | CAGAGAATGG | 900 |
| AGAGAGGTTA | GGAGGCAAAAG | GCAAATGTGG | AGCTTTGATG | ATGTTGATGC | 950 |
| ACGCCGTCAG | CTTTTCTTCA | CGCCTGCTCC | CACTCACTCA | CACCTATGAA | 1000 |
| CATTCTCTCT | CTATTTTATA | ATTATATTCA | CATGTCTCTA | TGTTACTATG | 1050 |
| TAAATGGTGA | CCACTTAAAGT | ATTTATATAT | CATGTATATA | TCTTATAGGT | 1100 |
| ATCATACAAA | ATGGTCATGA | AACTTTTGCA | ATTTCAATCT | ACTTGTTTCAT | 1150 |
| TGTAGATGCT | AGCTTTTCAC | ATGTTTGTAA | AATTAGTCTG | GATCTGAAAT | 1200 |
| TCTTTAATTA | GCATTGTTTT | GTTGGTCAAC | GTTTAATTTT | TTGATTATTG | 1250 |
| ATGTCAAAAA | TTCAGAGCGT | TCAGAACTCT | TACACTAATT | TCTTAAAAAT | 1300 |
| AATCGATTAA | GAGAAAATAG | AGTTTTTCATG | CACCAGTGTT | GATAGTAACG | 1350 |
| TAGTCGCGGA | ATGTCTAAAA | CGATTATGAG | TTTGGTGTTT | TGATTGGTTA | 1400 |
| GAATTGGTAT | TAGTAGGACA | TTCTAACTTT | TTTGTTAGTC | TGTTGATTTA | 1450 |
| GGATGCGTAA | AGAGTCTTTT | TATTTTACAC | CAGTTGAGAC | TTGGGATCGA | 1500 |
| TAGTACTTGA | AACACTTGGT | TGGTTTCATG | TATTTGGCCT | ATATATAAAC | 1550 |
| AAACATCGTA | ATTATATACG | GATTTTTTTC | GGAATTTTAC | GCCATATCTG | 1600 |
| TAAGTATATA | TAACATGCAT | GTCGTTTTCA | AATTCATATG | ATGAACGATC | 1650 |
| CACGTAAGTG | CTACTACTCC | TACAATATTG | CATGAGAGAG | ATATGTATTT | 1700 |
| ATAAATTTTA | TTTTGAAGAA | GAAATAAGAG | GGAAGGTAC | TTGGGTGGAT | 1750 |
| CGATGTGAAA | ACAAAAGAAG | AAAAAGCGAA | ACCCACTAAG | CCATTACATG | 1800 |
| ATATCGACCT | TCTTATCTTT | TTCTCTTTTA | TTTTATTTTT | CTCAGGACTT | 1850 |
| TTTTCTACTT | AATGAAACCT | CCAAACTATC | TAACTAATAC | ACTCCCATGT | 1900 |
| AGAATAAAGA | AAATTATATA | AGATATTGTT | GATATTTTGT | AACTAGAAAA | 1950 |
| TATATTTGCT | CTGTAATTTT | TCGTAAGTTA | AATCAACATT | TTTCAGTAGA | 2000 |
| AACAAATATT | ACTGCAAAAA | GTAGGATCAT | TATTTTGTTC | CAAAATCTCA | 2050 |
| GTTAGCTATA | GGGTGTAGT | AAAAACAAAA | CACATCTTGT | ATTTGCCCCA | 2100 |
| AAAAATAAAG | AGAGAGAAGA | ATATTGTTCA | AAAGTGGTCT | CTTCTCTCTC | 2150 |
| TAATTATGTT | TTCATAAAC | CCAATTAGAT | TCAAACAGTC | TACAAAGTCC | 2200 |
| AAAAGATAAA | CATGGGACAA | CAATTCGATG | CAAAAAATCC | TCTTTTCATG | 2250 |
| CTCTTTTTTT | ATTCTCTAGT | CTTTTAAATT | ACTAATAAAA | ACTCACAAAT | 2300 |
| CCACCAAACC | CATTCTCTAC | AACTCACCTT | CATCTAGATT | TACCCACTCC | 2350 |
| CACCGAGAAA | CACAAGAAAA | AAAATATACA | TATATAAATA | TACAAGACAA | 2400 |
| CACATGATGC | TGATGCAATA | TACACAACAA | AGTATTAAAT | CTTAGATATT | 2450 |
| GTGGGTCTCC | CTTTCTTCTA | TTCATTTTCT | TATTCATTAA | AAAAAAAAAA | 2500 |
| TG | | | | | 2502 |

17/24



RB, right border sequence from *Agrobacterium* Ti plasmid
 SHRpro, 2.5-Kb 5' upstream region of *SHORT-ROOT* gene
 TE, translational enhancer element of tobacco etch virus
 SHR cds., *SHORT-ROOT* protein domain coding region
 GR, rat glucocorticoid receptor protein domain coding sequence
 GFP, green fluorescent protein coding sequence
 Nos-T, transcription terminator of nopaline synthetase gene
 35S-P, cauliflower mosaic virus 35S promoter
 HPT, hygromycin phosphotransferase coding sequence
 NPT, neomycin phosphotransferase coding sequence
 LB, left border sequence from *Agrobacterium* Ti plasmid

FIG. 12A

18/24

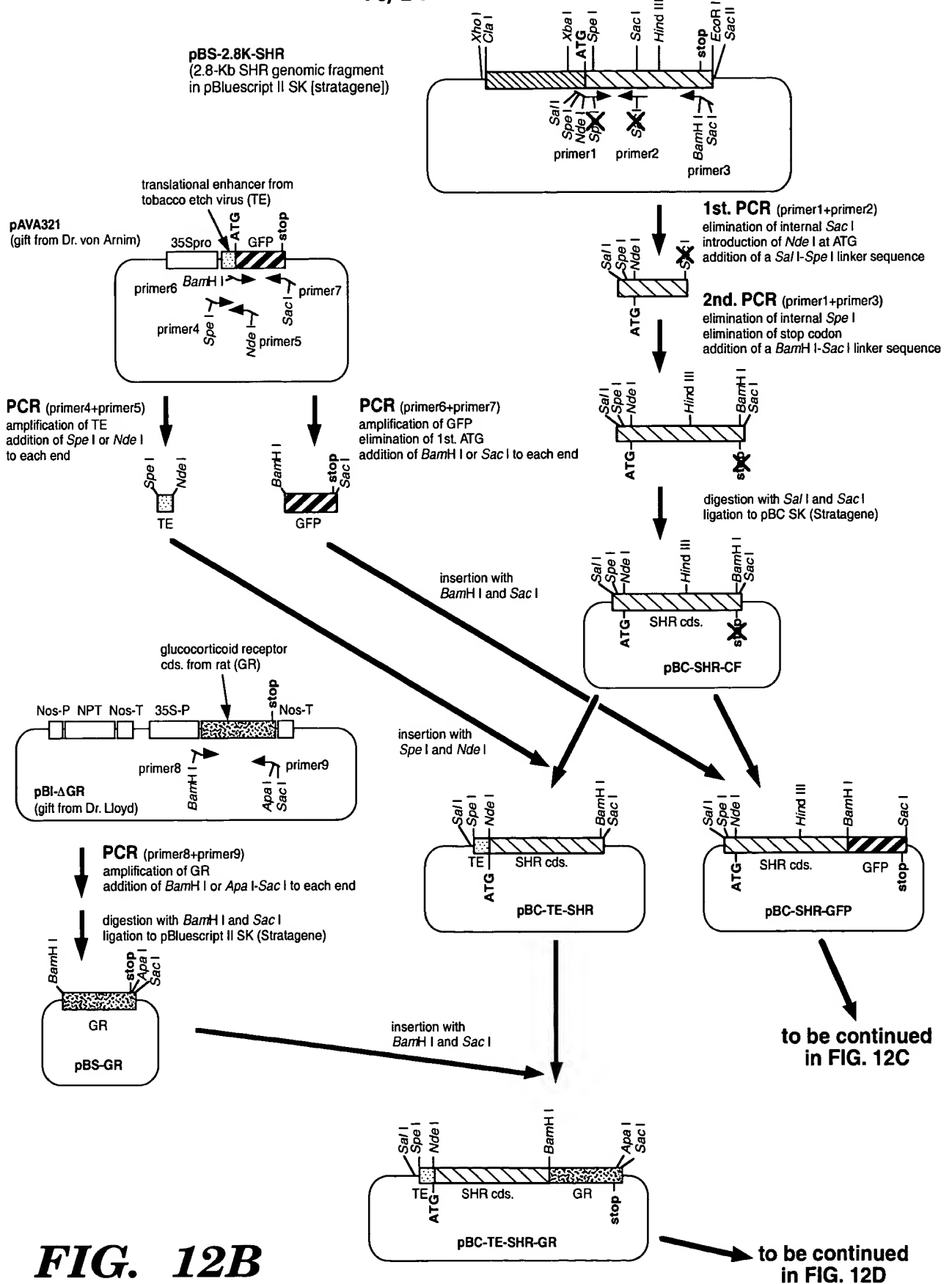


FIG. 12B

19/24

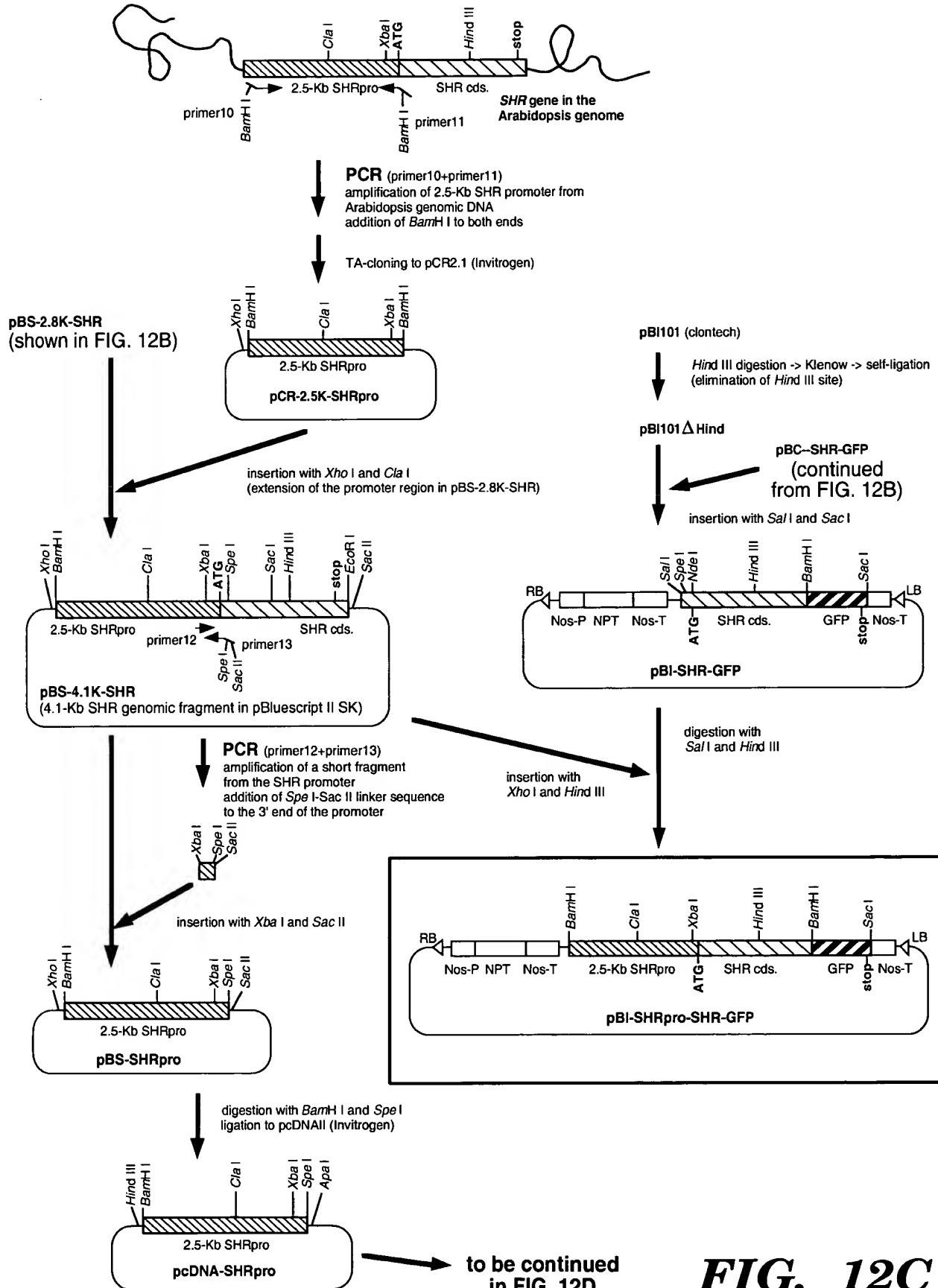


FIG. 12C

20/24

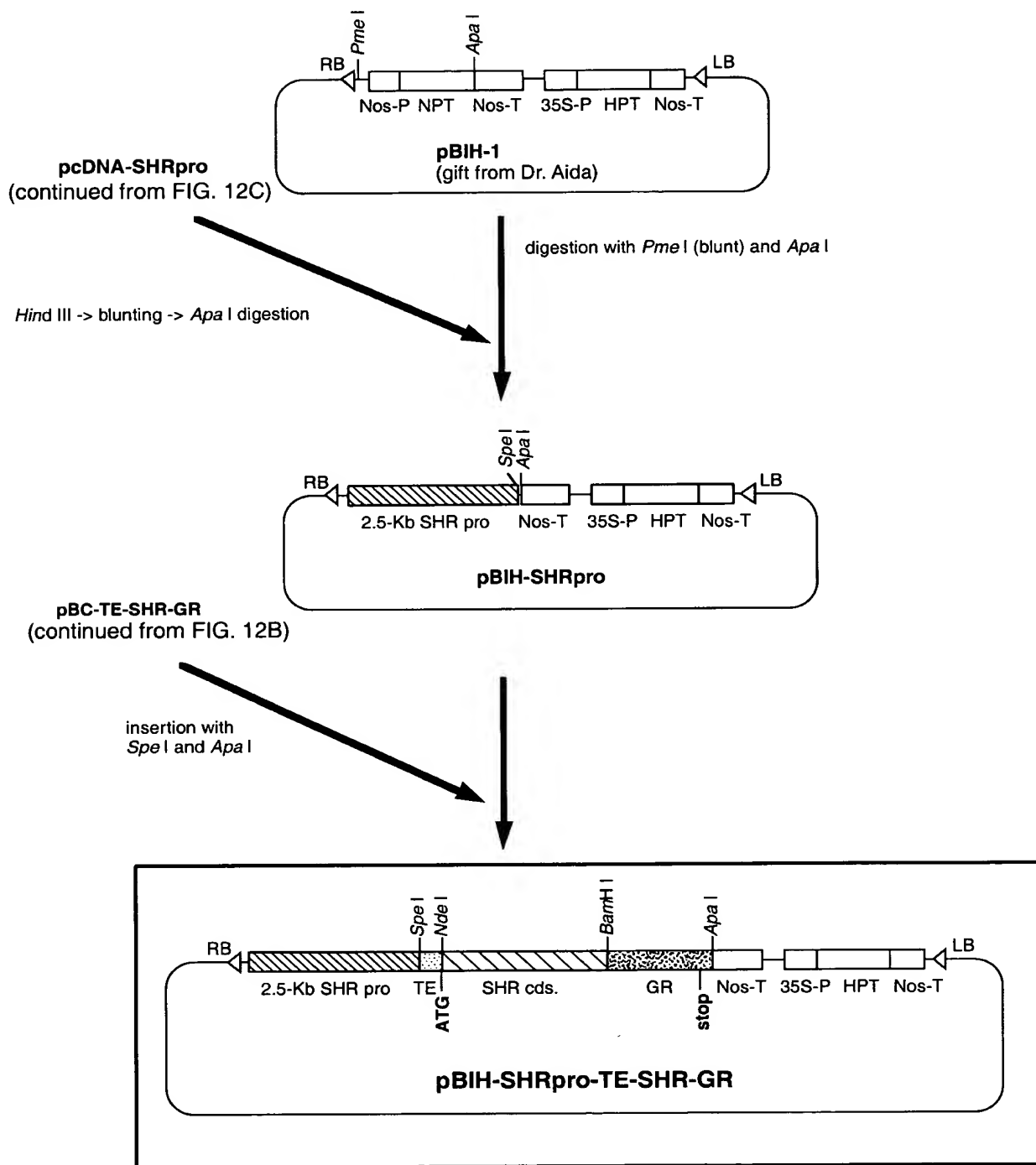
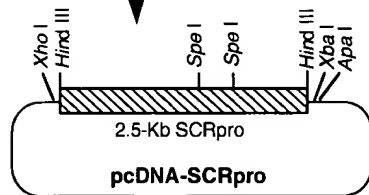


FIG. 12D

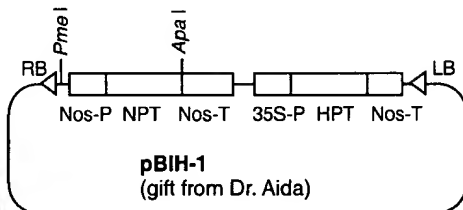
pBS-2.8K-SHR
(2.8-Kb SHR genomic fragment
in pBluescript II SK (stratagene))



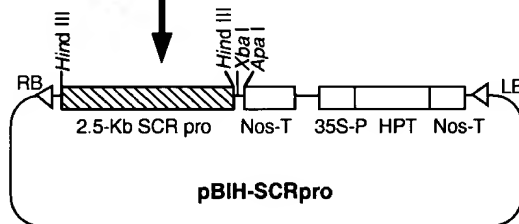
digestion with *Xho* I and *Xba* I
ligation to pcDNAII (Invitrogen)



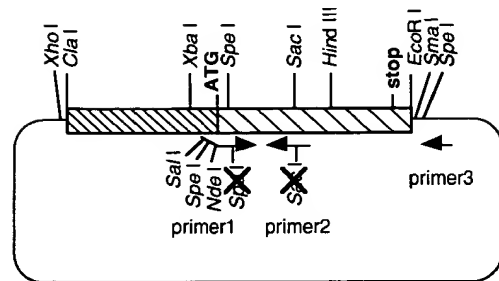
Xho I -> blunting ->
Apa I digestion



digestion with *Pme* I (blunt) and *Apa* I

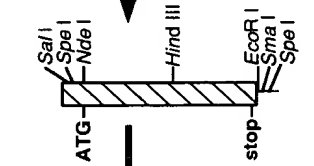
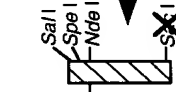


digestion with *Xba* and *Apa* I

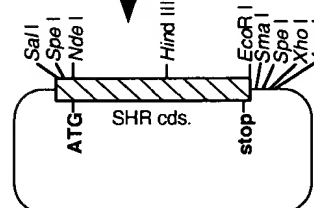


1st. PCR (primer1+primer2)
elimination of internal *Sac* I and *Spe* I
introduction of *Nde* I at ATG
addition of a *Sal* I-*Spe* I linker sequence

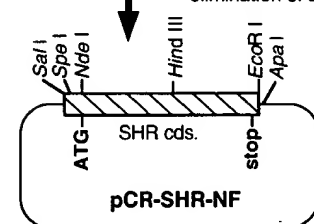
2nd. PCR (primer1+primer3)



Cloning to pCR2.1 vector (Invitrogen)



Xho I -> blunting -> *Sma* I digestion
elimination of a downstream *Spe* I site



insertion with *Spe* I and *Apa* I

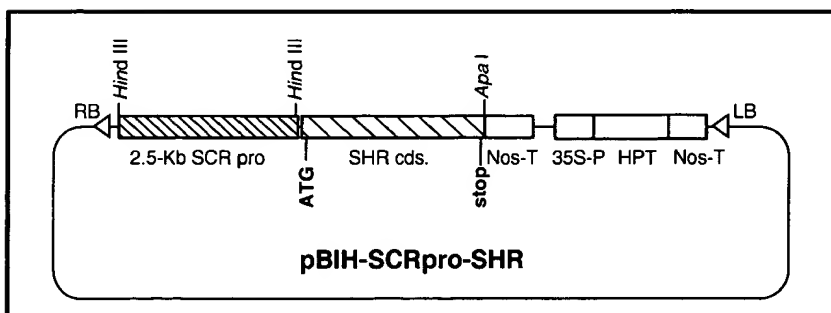
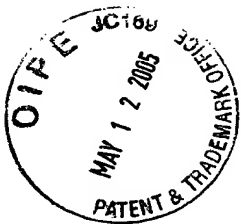
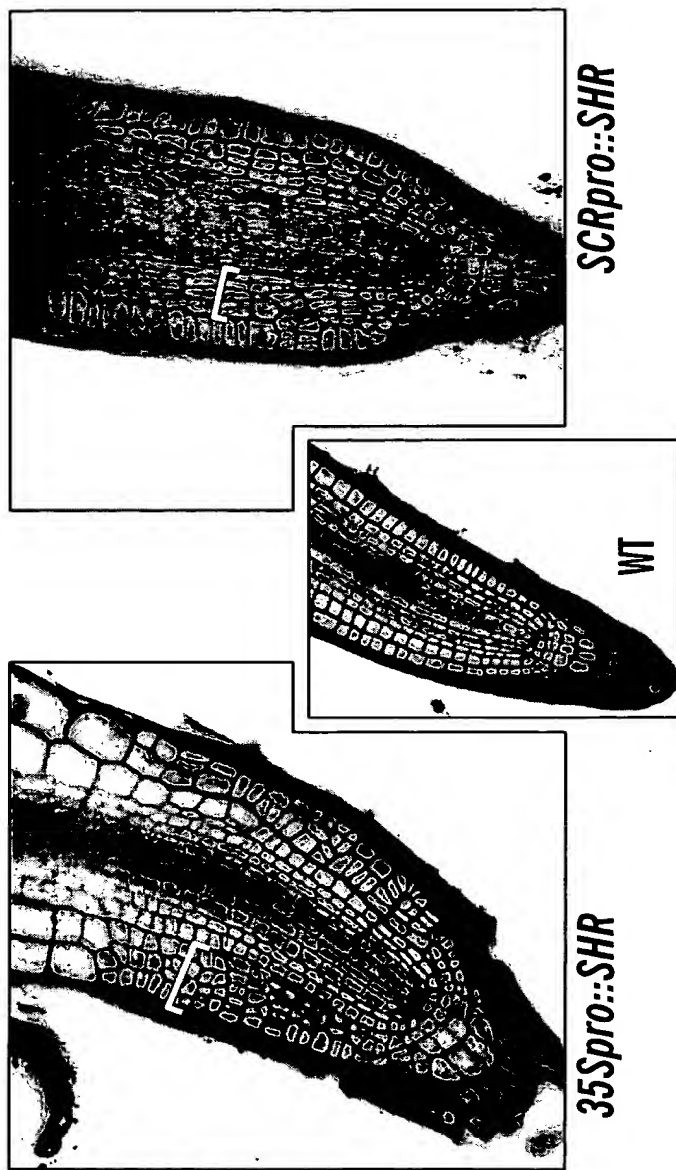


FIG. 13



22/24

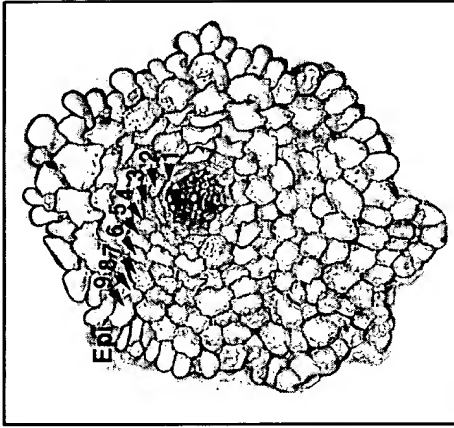


ECTOPIC *SHR* EXPRESSION CAUSED ABNORMAL ROOT CELL DIVISIONS

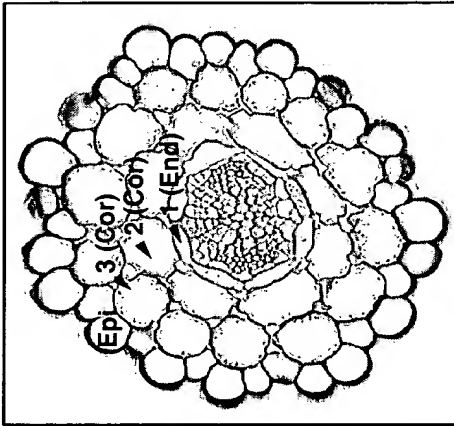
FIG. 14

23/24

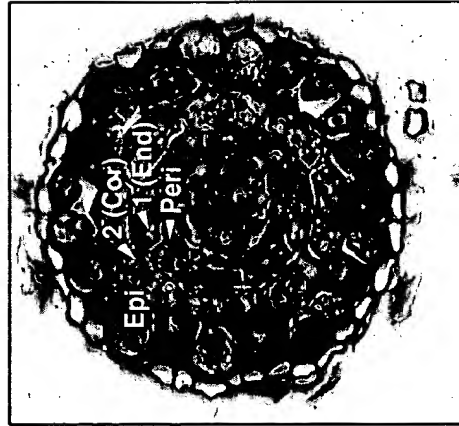
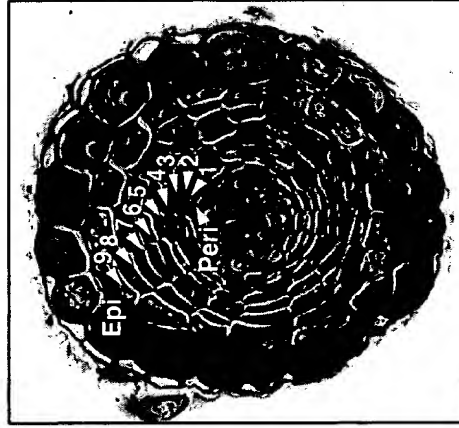
SCRpro::SHR transgenic



WT



hypocotyl



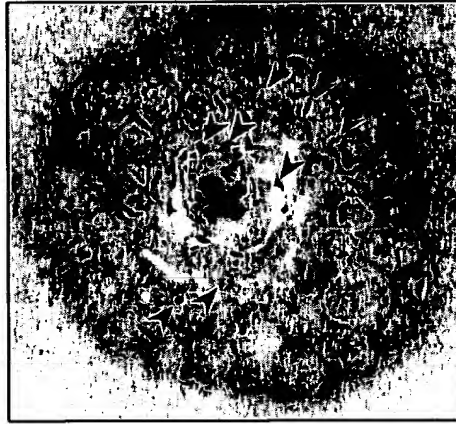
root

ECTOPIC *SHR* EXPRESSION UNDER THE *SCR* PROMOTER RESULTED IN THE INDETERMINATE CELL DIVISIONS IN GROUND TISSUE.

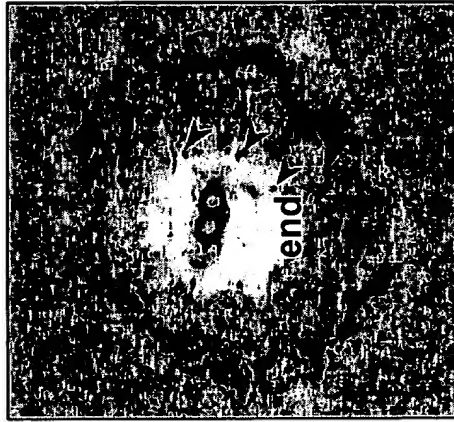
FIG. 15

24/24

SCRpro::SHR transgenic



WT



Casparian strip occurs ectopically in the *SCRpro::SHR* transgenic root

FIG. 16